

NEW SPECIES OF *ATHLETA (TERNIVOLUTA)* AND *NANNAMORIA*
(MOLLUSCA : VOLUTIDAE) FROM THE CAPRICORN CHANNEL,
CENTRAL QUEENSLAND, AUSTRALIA.

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SUMMARY

Athleta (Ternivoluta) insperata, sp. nov. and *Nannamoria inopinata* sp. nov. are described from 168-365 m in the Capricorn Channel of central Queensland, Australia. The former is closely related to the Late Miocene *A. (T.) bungae* Darragh and the latter to the Middle Miocene *N. limbata* (Tate) from the Tertiary of south-eastern Australia.

INTRODUCTION

The occurrence in Australia of deeper water volute species closely related to common Tertiary fossil volutes is now reasonably well documented. (Darragh, 1971; Wilson, 1972). Genera, such as *Livonia*, *Ericusa*, *Notopeplum*, *Nannamoria*, *Notovoluta* and *Athleta (Ternivoluta)*, are widely distributed in the fossil record and they are the dominant element in the volute fauna of the present day, particularly in the cool to warm temperate waters of the continental shelf of the southern half of the continent. It is, therefore, not surprising that dredging in the deep waters of the Capricorn Channel has yielded further examples of such species.

The 1977 *Kimbla* cruise through the Capricorn Group by the Australian Museum has resulted in the extension northward of many records of southern species and, in addition, brought to light hitherto undescribed material. Through the kindness of Dr. Winston Ponder, Curator of Molluscs, Australian Museum, Sydney, the writer has been permitted to examine and report on the volute material from this expedition.

There are two new volute species to hand at present and it is anticipated that other species will come to light in the future. The first is a species of *Athleta (Ternivoluta)*, closely related to *A. (T.) bungae* Darragh from the late Miocene of Gippsland, Victoria. Hitherto, this subgenus, though known from many species in the fossil record (Darragh, 1971), has been represented in the living fauna by a single species *A. (T.) studeri* (Martens), the type of the genus. The latter species has a restricted distribution in deep water (100 - 180 m) off Southern Queensland and Northern New South Wales.

The other taxon is a species of *Nannamoria*, very closely related to *N. limbata* (Tate) from the Middle Miocene of Central and Western Victoria. *Nannamoria* (= *Paramoria*)

is represented by four living species which range from the Central West Coast of Western Australia around to Southern Queensland. These species are *N. capricornea* (Wilson), *N. guntheri* (Smith), *N. amacula* Iredale and *N. parabola* Garrard. The occurrence of this new species extends the range of the genus to Central Queensland and about as far north on the east coast of Australia as on the west coast. It should be noted here that the writer does not consider that there are sufficient grounds for separating *Paramoria* [McMichael], 1960 (Type species, *Voluta guntheri* Smith) from *Nannamoria* and that *N. capricornea*, originally placed in *Volutoconus*, but correctly compared by Wilson (1972) with the Miocene fossils, *N. ralphi* and *N. limbata*, is regarded by the writer as a *Nannamoria*. The reasons for these assignments will be given in more detail in another place.

SYSTEMATIC DESCRIPTIONS

Athleta (*Ternivoluta*) Martens, 1897

Athleta (*Ternivoluta*). Darragh, 1971, p. 170 (with detailed description and synonymy)

The writer (Darragh, 1971) has revised the taxa in this subgenus in some detail and also has commented on relationships of other generic taxa in the subfamily. Rehder (1974) has questioned some of the writer's proposals, based on his belief that the columella folds within the subfamily are of major systematic importance at the generic level. It is not the intention here to enter into a detailed critique of Rehder's proposals except where they have a bearing on the material in hand, however, the writer does not believe that columella plaits can be used reliably as Rehder has done.

Rehder prefers to accept *Volutocorbis* Dall, 1890 as a genus in its own right, distinct from *Athleta*, and places *Ternivoluta* as a subgenus of *Volutocorbis*. Whether one considers *Athleta* and *Volutocorbis* as separate genera or not, is a matter of opinion, and the writer prefers to adhere to his original opinion that they are not separate taxa. If *Volutocorbis* is accepted, it can only be used for the group of Paleocene cancellate species in North America. The European Eocene and South African living cancellate species are homeomorphs and are not directly related to the type species of *Volutocorbis*, *V. limopsis*. As the writer has already noted (Darragh, 1971), cancellate sculpture can and does arise many times in separate lineages within the Tertiary in this subfamily, including the Australian representatives. The writer has made it clear that the living *Ternivoluta stuederi* and the Australian Tertiary species are part of the one lineage and must all be placed in the same generic taxon, not as Rehder suggests, the Tertiary species in *Volutocorbis* and the single living species in *Ternivoluta*. Contrary to Rehder's statement, the Tertiary species have an identical protoconch to the living as the writer has stated and illustrated (Darragh, 1971, p. 170, Fig. B, C). The collumella pad that Rehder states is not present in the Tertiary species and is present in living *Ternivoluta* is a variable feature. It is often present on specimens of the Tertiary species and it is often absent. Certainly it is variable feature on specimens within the same species and seems to be present on the more mature specimens in the population. Its presence or absence can have no generic or specific significance in this instance. The discovery of a new living species of *Ternivoluta*, closely related to the late Miocene *A. (T.) bungae* further strengthens the writer's argument.

FIGURES 1-11.

- 1, 6 *Nannamoria inopinata* sp. nov., C 108644 a, holotype, 42 km N.E. of Lady Musgrave Is., Qld., x 1.25.
2. *Nannamoria inopinata* sp. nov., C 108644 b, paratype, 42 km N.E. of Lady Musgrave Is., Qld., x 1.3.
- 3, 5. *Nannamoria inopinata* sp. nov., C 109012, paratype, 39 km E. of Lady Musgrave Is., Qld., x 1.5.
- 4, 7. *Athleta* (*Ternivoluta*) *insperata* sp. nov., C 108686 b, paratype, E. of North West Is., Qld., x 2.
- 8-9. *Athleta* (*Ternivoluta*) *insperata* sp. nov., C 109017, holotype, 30 km off North Reef, Qld., x 2.
- 10-11. *Athleta* (*Ternivoluta*) *insperata* sp. nov., C 108686 a, paratype, E. of North West Is., Qld., x 1.7.

All specimens coated with ammonium chloride except in figures 6 and 9.



1



2



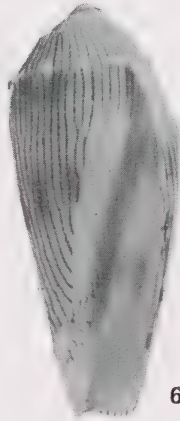
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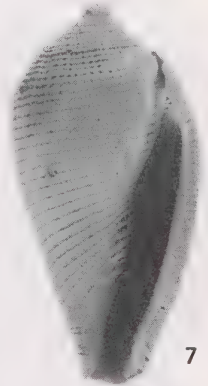
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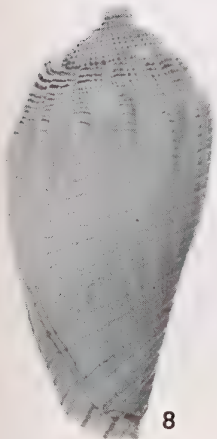
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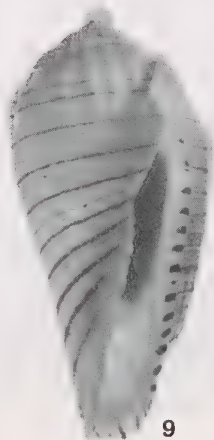
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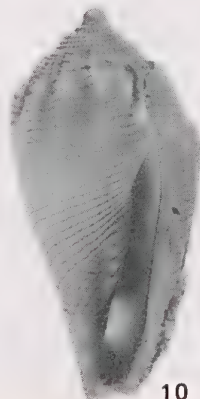
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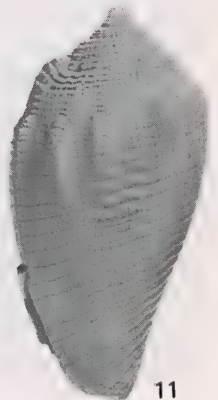
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9



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11



FIGURE 12. *Nannamoria inopinata* sp. nov., C 108644 a, radula of holotype.

Athleta (Ternivoluta) insperata sp. nov.

Figures 4, 7–11

DESCRIPTION: Shell pyriform with a domelike to subconical spire and rounded bodywhorl tapering gently to the anterior canal. Protoconch prominent, smooth, large (2.2 mm) of 1½ whorls, the first whorl of which is globose and deviated at right angles to the axis of the shell; second half whorl merging abruptly with the spire whorls. Posterior whorl slope of spire without sutural groove and somewhat convex, producing an almost domeshaped spire. Posterior whorl slope of body whorl convex; anterior whorl slope convex posteriorly then tapering gently to the anterior. Shoulder of body whorl very weakly, if at all, developed. Sculpture on spire cancellate, consisting of fine subequal lirae and axial costae, nodulate at their intersection. Body whorl with more prominent spiral lirae; axial sculpture weak except near the shoulder where it forms short, thick plicae which are raised into slight nodes where crossed by the spiral lirae. Columella with two or three major plaits and many minor plaits on a thick raised columella pad.

Colour of shell, light fawn to cream with thin spiral chestnut lines.

Animal with a broad flat foot; operculum and siphonal appendages absent; eyes on prominent stalks. Head divided by a prominent median cleft and laterally produced into two tentacles behind which are situated the eye stalks. Tubular salivary gland of anterior digestive system very long and separated from the racemose salivary gland. Gland of Leiblin arising from the oesophagus well behind the oesophageal nerve ring.

DIMENSIONS: Holotype C 109017	L 31	HA 26	W 16
Paratype C 108686 a	L 33	HA 25	W 17
Paratype C 108686 b	L 27	HA 21	W 14

LOCATION OF TYPES: Australian Museum, Sydney.

Holotype C 109017, collected P. Colman and F. Rowe, 18 Nov. 1977.

Paratypes C 108686 a, b, collected W.F. Ponder and I. Loch, 14 Dec. 1977.

TYPE LOCALITY: 30 km off North Reef, Capricorn Group, Queensland. 23° 11.5'S, 152° 14.5'E. 188 m, thick, grey mud. 1977 *Kimbla* Cruise Station 4.

OCCURRENCE: 40 km E. of Lady Musgrave Is., Queensland. 24° 44'S, 152° 49'E, 348–357 m, shelly grey ooze. 1977 *Kimbla* Cruise Station 2, 17 Nov. 1977. 39 km E. of Lady Musgrave Is., Queensland. 23° 33.7'S, 152° 37'E. 348–339 m. 1977 *Kimbla* Cruise Station 3, 17 Nov. 1977. East of North West Is., Capricorn Channel, Queensland. 23° 19.5'S, 152° 35.4'E. 320 m globigerina mud. 1977 *Kimbla* Cruise Station 23, 14 Dec. 1977. 42 km N.E. of Lady Musgrave Is., Queensland. 23° 38.8'S, 152° 45.5'E, 365 m. 1977 *Kimbla* Cruise Station 24, 14 Dec. 1977.

MATERIAL: Types, seven adult and four juvenile specimens and seven fragments.

COMMENTS: This species most closely resembles the Late Miocene *Athleta* (*Ternivoluta*) *bungae* Darragh from Gippsland, Victoria, from which it is probably descended. It is, however, approximately half the size of that species, has a dome-like rather than conical spire, has more prominent shoulder nodules on the body whorl and the sculpture of the spire is much finer and more evenly cancellate. The other living species of the subgenus *A. (T.) stuederi* Martens, differs in having a prominent shoulder and is almost devoid of axial or spiral sculpture. None of the other species of the subgenus has any close resemblance.

The gross morphology of the animal is very similar to that of *Athleta* (*A.*) *abyssicola* from southern Africa (Woodward, 1900). The radula was not able to be examined. A specimen of *A. (Ternivoluta) stuederi* (Australian Museum C 63142) was examined externally and this had a head with a prominent median cleft, eyes on long stalks and lacked siphonal appendages as in the above species.

The colour pattern is similar to that preserved on specimens of *Athleta* (*A.*) *spinosa* (Linnaeus) from Grignon (Mid. Eocene) in the Paris Basin.

Nannamoria Iredale, 1929

Nannamoria Iredale, 1929 *Rec. Aust. Mus.* 17(4): 181. (Type species: *Nannamoria amricula* Iredale).

Nannamoria inopinata sp. nov.

Figures 1-3, 5-6, 12

DESCRIPTION: Shell biconic to subcylindrical with a short blunt almost dome-like spire. Protoconch of three dome-like whorls, coiled in the axis of the spire. Spire whorls convex, partly concealed by the overlapping of succeeding whorls and occasionally bearing small spinose nodules at the anterior suture. Body whorl gently convex and tapering anteriorly, bearing at the posterior quarter a row of 8-10 blunt to subspinose nodules. Spiral and axial sculpture absent. Columella with five strong plaits and three or four other weaker plaits inserted between the others. Siphonal notch and fasciole barely developed.

Colour pattern of numerous thin, anastomosing, axial, chestnut lines over the whole shell and on the body whorl, two dark reddish bands at the posterior and anterior third of the whorl.

Animal very similar to that of *N. amricula*. Foot broad, flat, entire; siphonal appendages short, paired and equal; tubular salivary gland of digestive system, short, paired and easily separated from the racemose salivary gland. Radula uniserial, tricuspid with the central cusp the larger.

Colour of animal white with a network of numerous thin chestnut lines.

DIMENSIONS:	Holotype C 108644 a	L 48	HA 41	W 20
	Paratype C 108644 b	L 39	—	W 17
	Paratype C 109012	L 40	HA 34	W 17

LOCATION OF TYPES: Australian Museum, Sydney: Holotype C 108644 a, Paratype C 108644 b, collected W.F. Ponder, I. Loch and P. Terrill, 14 Dec. 1977; Paratype C 109012 collected P. Colman and F. Rowe, 17 Nov. 1977.

TYPE LOCALITY: Capricorn Channel, 42 km N.E. of Lady Musgrave Is., Queensland. 23° 38.8'S, 152° 45.5'E, 365 m, 1977. *Kimbla* Cruise Station 24, 14 Dec. 1977.

OCCURRENCE: 40 km E. of Lady Musgrave Is., Queensland, 24° 44'S, 152° 49'E, 348-357 m shelly grey ooze, 1977. *Kimbla* Cruise Station 2, 17 Nov. 1977. 39 km E. of Lady Musgrave Is., Queensland. 23° 33.7'S, 152° 37'E, 348-339 m 1977 *Kimbla* Cruise Station 3, 17 Nov. 1977. East of North West Is., Capricorn Channel, Queensland. 23° 19.5'S, 152° 35.4'E. 320 m globigerine mud, 1977 *Kimbla* Cruise Station 23, 14 Dec. 1977.

MATERIAL: Types, two adults and four juvenile specimens and six fragments.

COMMENTS: This species most closely resembles the Middle Miocene *N. limbata* (Tate) from Victoria from which it differs by the dome-like, rather than pupiform protoconch, by the complete absence of spiral sculpture and the lack of lamella extension of the posterior part of the whorls, typical of the latter.

From *N. ralphi* (Finlay), it differs by its more slender and elongate shape and relatively low spire. The dark spiral bands of the colour pattern are somewhat similar to those preserved on *N. limbata*. Neither *N. ralphi* nor *N. limbata* have the subspinose nodules as sharply developed as in *N. inopinata*. Of the living species of the genus, *N. parabola* Garrard from southern Queensland and northern New South Wales has a similar colour pattern, but is half the size with a gradate spire

and prominent spinose shoulders. *N. capricornea* (Wilson) from Western Australia, has a more conical spire, is two-thirds the size, has no subspinose nodules and lacks any linear type colour pattern. This latter species also lacks spiral sculpture.

A specimen of *Nannamoria amicula* (Australian Museum C 94314), dissected by the author, has a morphology virtually identical to that of *N. inopinata*. The radula is also similar. *N. guntheri* (National Museum of Victoria F 27907) and, indeed, a large number of species of *Amoria*, which the author has examined, also have similar anatomical morphologies except that the radula is unicuspid.

ACKNOWLEDGEMENTS

I am grateful to Dr. W.F. Ponder, Australian Museum for making the material available and to his staff for sorting it out from voluminous dredgings. The photographs are the work of Mr. F. Coffa, National Museum of Victoria and I acknowledge with thanks the care he has bestowed upon them.

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